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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,244	01/10/2004	John M. Brookfield	A3184Q1-US-NP	9652

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EXAMINER	
FIDLER, SHELBY LEE	

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/755,244	BROOKFIELD ET AL.	
	Examiner	Art Unit	
	Shelby Fidler	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-7,12-20 is/are rejected.

7)☒ Claim(s) 8-11 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 1/10/2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6/2/05 and 9/1/05.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12 and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kimura (US 6206503 B1).

Kimura teaches the following:

***regarding claim 12**, a drop emitting device comprising:

a non-slanted pair of nozzles aligned along an X-axis and substantially parallel to a Y-axis that is orthogonal to the X-axis (*elements NC_{11} and NC_{12}, Figure 1*);

a slanted pair of nozzles offset along the X-axis so as to be slanted relative to the X-axis (*elements NB_{11} and NB_{21}, Figure 1*); and

wherein the slanted pair of nozzles is displaced from the non-slanted pair of nozzles along the Y-axis (*Figure 1*);

***regarding claim 14**, one of the nozzles of the slanted pair of nozzles is aligned along the X-axis with the non-slanted pair of nozzles (*elements NB_{11} and NC_{11}, Figure 1*)

***regarding claim 15**, the non-slanted pair of nozzles emit drops of a first color (*elements NC11-NC1N emit yellow, Figure 1*) and drops of a second color (*elements NC21-NC2N emit Magenta, Figure 1*)

***regarding claim 16**, the slanted pair of nozzles emit drops of a third color and a fourth color (*element NB11 emits black and element NB21 emits black, Figure 1*)

***regarding claim 17**, the non-slanted pair of nozzles emit cyan and magenta drops (*element NC21 emits magenta and element NC31 emits cyan, Figure 1*)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura (US 6206503 B1) in view of Torgerson et al. (US 6523935 B2).

Kimura teaches all claimed limitations except for the following:

***regarding claim 13**, the nozzles of the slanted pair of nozzles are offset along the X-axis by at most 0.005 inches

Torgerson et al. teaches the following:

***regarding claim 13**, the nozzles of the slanted pair of nozzles are offset along the X-axis by at most 0.005 inches (*1/300 inches, col. 4, lines 53-58*)

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify Kimura's invention with Torgerson's nozzle pitch. The motivation for doing so, as taught by Torgerson, is to achieve a certain resolution (*col. 5, lines 6-11*).

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura (US 6206503 B1) in view of Bloomberg (US 6425653 B1).

Kimura teaches the following:

***regarding claim 18**, the slanted pair of nozzles that emit black drops (*col. 2, lines 34-37*)

***regarding claim 19**, the non-slanted pair of nozzles emit cyan drops and magenta drops (*element NC21 emits magenta and element NC31 emits cyan, Figure 1*)

Kimura does not teach the following:

***regarding claims 18 and 19**, the emitting of yellow drops

Bloomberg teaches the following:

***regarding claims 18 and 19**, the emitting of yellow drops from nozzles (*col. 6, lines 22-28*)

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify Kimura's slanted pair of nozzles to print a different color, such as yellow. The motivation for doing so, as taught by Bloomberg is to print in color instead of black (*col. 6, lines 22-28*).

Claims 1, 3-7, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanda et al. (US 6502921 B2) in view of Usui et al. (US 6033058)

Kanda et al. teaches the following:

***regarding claim 1,** a drop emitting device comprising:

a first linear array of side by side substantially mutually parallel first columnar arrays of drop emitting nozzles (*element 11, Figure 5*), the first linear array extending along an X-

axis, and the first columnar arrays being oblique to the X-axis (*X-axis is read as an unshown vertical axis of Figure 5*);

the first columnar array of drop emitting nozzles comprised of a first linear sub-column of N nozzles (*elements 1 in even columns, Drawing A relevant to element 11 of Figure 5: see below*) that is interleaved with and substantially parallel to an associated second linear sub-column of N nozzles (*elements 1 in odd columns, Drawing A relevant to element 11 of Figure 5: see below*) so as to form N first pairs of nozzles, wherein each first pair of nozzles includes a nozzle from the first linear sub-column and an adjacent nozzle from the second linear sub-column (*element 1 from even column with an adjacent element 1 from odd column form a pair, Drawing A: see below*), and wherein N is greater than 1 (*N=4 for the purpose of this rejection*);

wherein the first linear sub-columns of nozzles emit drops of a first color and the second linear sub-columns of nozzles emit drops of a second color (*col. 2, lines 48-53*);

a second linear array of side by side substantially mutually parallel second columnar arrays of drop emitting nozzles (*element 12, Figure 5*), the second linear array extending along the X-axis and being adjacent the first linear array along a Y-axis that is orthogonal to the X-axis, and the second columnar arrays being oblique to the X-axis (*X-axis is read as an unshown vertical axis of Figure 5*);

each second columnar array having an associated first columnar array displaced therefrom along the Y-axis (*Figure 5*);

each second columnar array of drop emitting nozzles comprised of a third linear sub-column of N nozzles (*elements 1 in even columns, Drawing A relevant to element 12 of Figure 5: see below*) that is interleaved with an substantially parallel to an associated fourth linear sub-column of N nozzles (*elements 1 in odd columns, Drawing A relevant to element 12 of Figure 5: see*

below) so as to form N second pairs of nozzles, wherein each second pair of nozzles includes a nozzle from the third linear sub-column and an adjacent nozzle from the fourth linear sub-column (*element 1 from even column with an adjacent element 1 from odd column form a pair, Drawing A: see below*);

each second nozzle pair having an associated first nozzle pair displaced therefrom (Figure 5);

wherein the nozzles of each second pair of nozzles are offset along the X-axis (*elements 1 of every other column are offset along X-axis, Drawing A relevant to element 12: see below*);

wherein the third linear sub-columns of nozzles emit drops of a third color and the fourth linear sub-columns of nozzles emit drops of a fourth color (*col. 2, lines 48-53*); and

wherein each of the first through fourth linear sub-columns has a nozzle pitch XP inches along the X-axis (*unreferenced distance in the X-axis direction between elements 1, Figure 5*)

***regarding claim 7**, one of the nozzles of each second pair of nozzles is aligned along the X-axis with the associated first pair of nozzles (*elements 1 from each odd or even column in element 11 are aligned with the associated pair of elements 1 in element 12, Figures 5 and 6*)

***regarding claim 20**, a drop emitting device comprising:

a first linear array of columnar arrays of first nozzle pairs (*element 12, Figure 5*), the first linear array extending along an X-axis and the columnar arrays of first nozzles extending obliquely to the X-axis (*X-axis is read as an unshown vertical axis of Figure 5*);

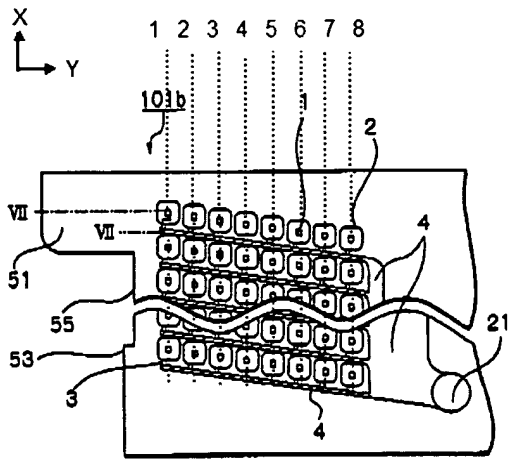
wherein one nozzle of each first nozzle pair emits drops of a first color and another nozzle of each first nozzle pair emits drops of a second color (*col. 2, lines 48-53*);

a second linear array of columnar arrays of second nozzle pairs (*element 11, Figure 5*), the second linear array extending along the X-axis and the columnar arrays of second nozzles extending obliquely to the X-axis (*X-axis is read as an unshown vertical axis of Figure 5*);

wherein the nozzles of each second nozzle pair are offset along the X-axis (*elements 1 are offset along the unshown vertical X-axis, Figure 5*);

wherein one nozzle of each second nozzle pair emits drops of a third color and another nozzle of each second nozzle pair emits drops of a fourth color (*col. 2, lines 48-53*);

wherein the first linear array and the second linear array extend along an X-axis (*X-axis is read as an unshown vertical axis of Figure 5*), and wherein the second linear array is adjacent the first linear array such that each first nozzle pair has an associated second nozzle pair displaced therefrom along a Y-axis that is orthogonal to the X-axis (*array 11 is adjacent to array 12, Figure 5*);



Drawing A: Figure 6 from Kanda et al. (US 6502921 B2) edited for clarification

Kanda et al. does not teach the following:

***regarding claim 1,** the nozzles of each first pair of nozzles are aligned along the X-axis and substantially parallel to a Y-axis that is orthogonal to the X-axis

***regarding claim 3**, each of the first through fourth sub-columns of nozzles has a nozzle pitch XP of at most about 1/75 inches along the X-axis

***regarding claim 4**, each of the first through fourth sub-columns of nozzles has a nozzle pitch XP of at most about 1/37.5 inches along the X-axis

***regarding claim 5**, the nozzles of each second pair of nozzles are offset along the X-axis by about XP/3 inches

***regarding claim 6**, the nozzles of each second pair of nozzles are offset along the X-axis by at most about 0.005 inches

***regarding claim 20**, the nozzles of each first nozzle pair are aligned along the X-axis

Usui et al. teaches the following:

***regarding claim 1,** the nozzles of each first pair of nozzles are aligned along the X-axis and substantially parallel to a Y-axis that is orthogonal to the X-axis (*nozzle openings are aligned along the axis perpendicular to the A-axis, where the A-axis is read as the Y-axis, Figure 6*)

***regarding claim 3**, each of the first through fourth sub-columns of nozzles has a nozzle pitch XP of at most about 1/75 inches along the X-axis (*1/90 inches, col. 4, lines 35-38*)

***regarding claim 4**, each of the first through fourth sub-columns of nozzles has a nozzle pitch XP of at most about 1/37.5 inches along the X-axis (*1/90 inches, col. 4, lines 35-38*)

***regarding claim 5**, the nozzles of each second pair of nozzles are offset along the X-axis by about XP/3 inches (*1/360 inches, where XP is read as 1/90 inches, col. 4, lines 35-42*)

***regarding claim 6**, the nozzles of each second pair of nozzles are offset along the X-axis by at most about 0.005 inches (*1/360≈0.0027 inches, col. 4, lines 39-42*)

***regarding claim 20**, the nozzles of each first nozzle pair are aligned along the X-axis (*nozzle openings are aligned along an axis, Figure 6*)

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify Kanda's nozzle pairs to align along the X-axis as taught by Usui. The motivation for doing so, as taught by Usui, is to increase the printing resolution of the printhead (*col. 1, lines 23-33*).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanda et al. (US 6502921 B2) in view of Usui et al. (US 6033058) as applied to claim 1 above, and further in view of Eriksen (US 5079571).

Kanda et al. and Usui et al. teach the following:

***regarding claim 2**, the first linear array of side by side substantially mutually parallel columnar arrays of drop emitting nozzles and the second linear array of side by side mutually parallel columnar arrays of drop emitting nozzles emit drops of ink (*col. 2, lines 49-53*)

Kanda et al. and Usui et al. do not teach the following:

***regarding claim 2**, emitting melted solid ink

Eriksen teaches the following:

***regarding claim 2**, emitting melted solid ink (*col. 3, lines 65-67*)

At the time of invention, it would have been obvious to a person of ordinary skill in the art to substitute melted solid ink for liquid ink. The motivation for doing so, as taught by Eriksen, is that the two types of inks are art-recognized equivalents (*col. 3, lines 65-67*).

Allowable Subject Matter

Claims 8-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The primary reason for indicating allowable subject matter in claim 8 is the inclusion of the limitations of a drop emitting device that includes each first columnar array of drop emitting nozzles comprised of a first linear sub-column of N nozzles that is interleaved with and substantially parallel to an associated second linear sub-column of N nozzles so as to form N first pairs of nozzles, wherein each first pair of nozzles includes a nozzle from the first linear sub-column and an adjacent nozzle from the second linear sub-column, and wherein N is greater than 1 and wherein the first and second colors are cyan and magenta. It is these limitations found in the claims, as they are claimed in the combination, that has not been found, taught, or suggested by the prior art of record which makes indicates allowable subject matter over the prior art.

The primary reason for indicating allowable subject matter in claim 9 is the inclusion of the limitations of a drop emitting device that includes each second columnar array of drop emitting nozzles comprised of a third linear sub-column of N nozzles that is interleaved with and substantially parallel to an associated fourth linear sub-column of N nozzles so as to form N second pairs of nozzles, wherein each second pair of nozzles includes a nozzle from the third linear sub-column and an adjacent nozzle from the fourth linear sub-column and wherein the third and fourth colors are yellow and black. It is these limitations found in the claims, as they are claimed in the combination, that has not been found, taught, or suggested by the prior art of record which indicates allowable subject matter over the prior art.

The primary reason for indicating allowable subject matter in claim 10 is the inclusion of the limitations of a drop emitting device that includes each first columnar array of drop emitting nozzles comprised of a first linear sub-column of N nozzles that is interleaved with and substantially parallel to an associated second linear sub-column of N nozzles so as to form N first pairs of nozzles, wherein each first pair of nozzles includes a nozzle from the first linear sub-column and an adjacent nozzle from the second linear sub-column, and wherein N is greater than 1 and each second columnar array of drop emitting nozzles comprised of a third linear sub-column of N nozzles that is interleaved with and substantially parallel to an associated fourth linear sub-column of N nozzles so as to form N second pairs of nozzles, wherein each second pair of nozzles includes a nozzle from the third linear sub-column and an adjacent nozzle from the fourth linear sub-column wherein the first and second colors are cyan and magenta and the third and fourth colors are yellow and black. It is these limitations found in the claims, as they are claimed in the combination, that has not been found, taught, or suggested by the prior art of record which indicates allowable subject matter over the prior art.

The primary reason for indicating allowable subject matter in claim 11 is the inclusion of the limitations of a drop emitting device that includes a second plurality of finger manifolds fluidically coupled to the second linear sub-columns; and a third plurality of finger manifolds fluidically coupled to the second linear sub-columns of nozzles; and a fourth plurality of finger manifolds fluidically coupled to the fourth linear sub-columns of nozzles. It is these limitations found in the claims, as they are claimed in the combination, that has not been found, taught, or suggested by the prior art of record which indicates allowable subject matter over the prior art.

The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure. Nakamura et al. (US 6488355 B2) and Kojima et al. (US 2004/0150693

A1) both teach of a linear array that extends along the X-axis, wherein the linear array is comprised of columnar arrays that extend obliquely to the X-axis. Nakamura et al. (US 6488355 B2) and Okuda et al. (US 2004/0041881 A1) both teach of first and second linear arrays that extend along the X-axis and are adjacent to each other.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelby Fidler whose telephone number is (571) 272-8455. The examiner can normally be reached on MWF 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SLF

K. FEGGINS
PRIMARY EXAMINER